

To learn how Mee Fog systems can increase your profitability contact:

Mee Industries Inc., Humidification Division

Telephone USA: 1.800.575.6808

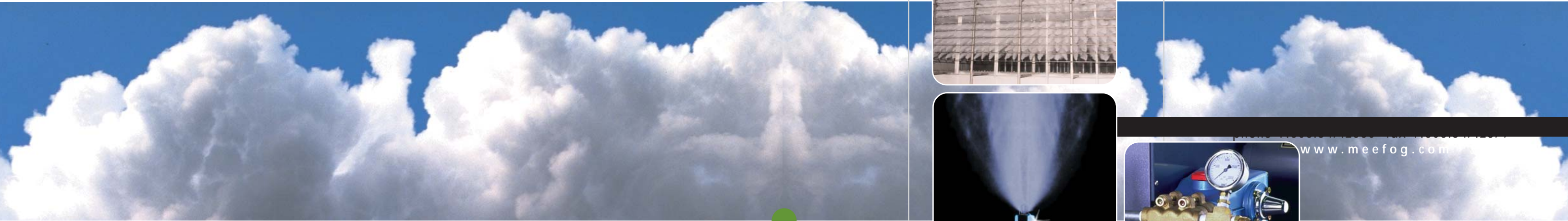
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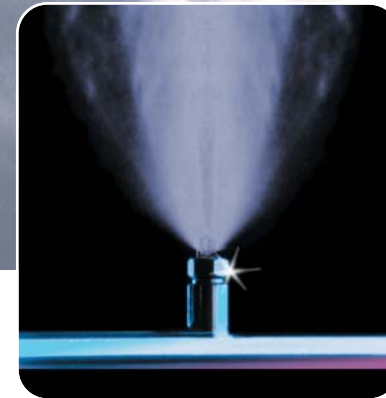
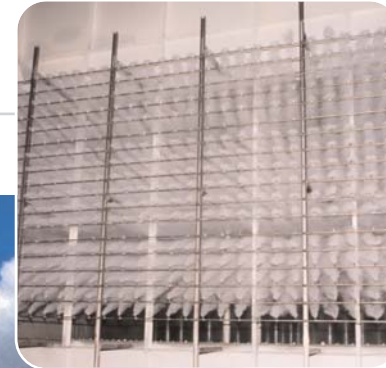


MEE INDUSTRIES'
CORPORATE PROFILE

Mee Industries Inc. is a high technology corporation with a demonstrated history of providing innovative, cost-effective fog solutions for a wide variety of humidification applications. In 1969, Thomas Mee Jr., a former Cornell University research scientist, founded the company that also specializes in fog solutions for gas turbine inlet air cooling, outdoor air conditioning, greenhouse climate control, wine barrel humidification, and special effects.

Mee Industries' turnkey solutions include carefully engineered, high quality, integrated packages delivering an outstanding combination of price and performance. Our products are backed by Mee Industries' experienced technical staff which includes leading researchers, project managers and engineers, and production and installation specialists. An active research & development group guarantees that Mee Industries maintains its fog system market and technology lead.

Mee Industries is a privately held company with corporate headquarters in Irwindale, California.



Humidification

Mee Fog SYSTEMS

The most advanced humidification solutions on the market today.



Innovative Humidification Solutions

MEE INDUSTRIES' MISSION

In a world increasingly dependent on humidification technology, Mee Industries helps its customers dramatically reduce energy costs while meeting today's more stringent indoor air quality (IAQ) requirements.

MEE FOG HUMIDIFICATION SYSTEMS

The Mee Fog system uses high-pressure pumps to pressurize treated supply water to between 1000 and 2000 psi. The stainless steel, Mee Fog nozzles then atomize the water into billions of ultra-fine fog droplets.

Mee Fog systems do not require compressed air or heat. Direct pressure means there are few moving parts (none in the air handlers or the humidified space). The energy consumed is a small fraction of that required by other technologies, such as compressed air, ultra-sonic, or canister steam systems.



Typical Mee Fog system pump station.

Dramatically Reduces Energy Consumption

IMPORTANT BENEFITS

- Very low energy consumption
- Easy to service and maintain
- Low installed cost
- Ultra-fine fog droplets
- Custom designed systems
- Stainless steel construction
- Flexible and easy to retrofit
- Easy to specify

Energy Cost Comparison (Annual)

Mee Fog System	\$75	0.4%
Centrifugal Humidifiers	\$980	6%
Ultrasonic Atomizers	\$1,270	8%
Compressed Air Atomizers	\$2,500	15%
Electric Steam Humidifiers	\$16,800	100%

Assumptions: \$.05 per kw hour, 1000 hours operation, 1000 lbs. per hour moisture output.

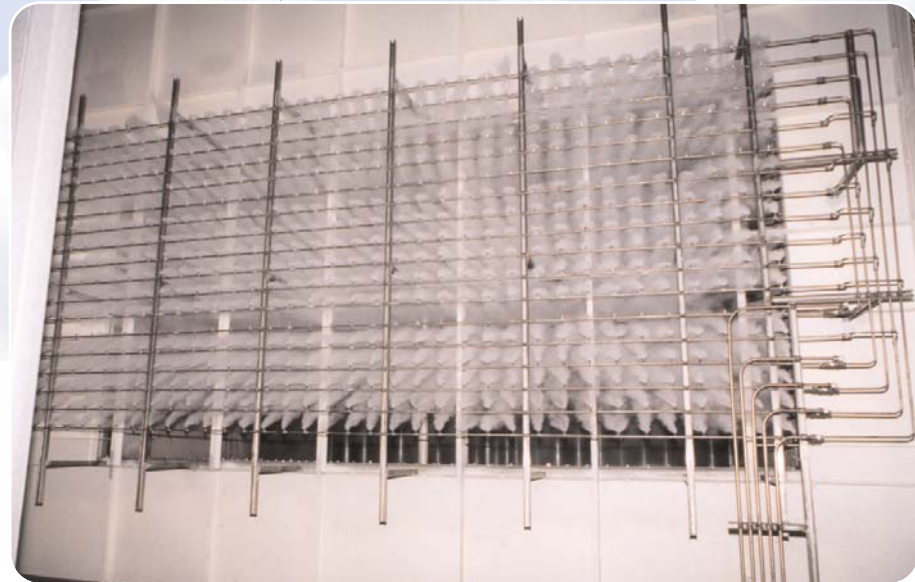
Mee Fog nozzles are installed in air handling units or air distribution ducts or in the treated space itself for in-room applications. For HVAC applications, a fog plenum is created in the duct or air handling unit and a fog droplet filter is used to remove un-evaporated fog droplets.

Every Mee Fog system is carefully and thoroughly engineered to fit the application. Our engineering staff will design the proper water treatment system and size the fog system based on building heat loads, ambient climate data, ventilation rates, etc.

Commercial Building Humidification

START SAVING TODAY

Mee Fog systems have been applied to a wide variety of commercial buildings, including banks and office buildings, schools and hospitals, document storage areas, museums, computer rooms, etc. Generally, commercial building humidification is done in the air ducts or air handling units. Applications that require more than 200 lbs. per hour (90 kg/hr.) of moisture are very cost-effective for Mee Fog technology.

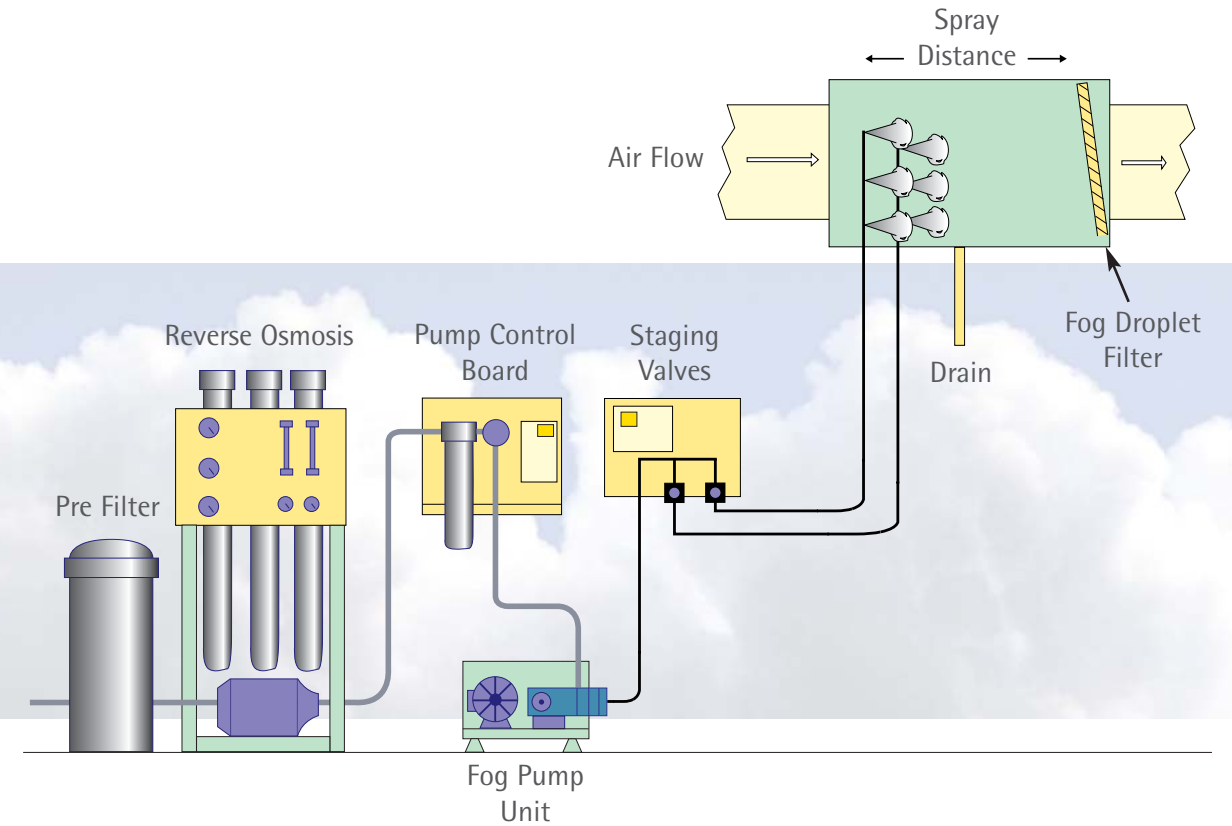


Some Mee Fog Users 1000's of Commercial Installations

- UNITED STATES POSTAL SERVICE HEADQUARTERS • TEXAS INSTRUMENTS • MERIDIA HOSPITAL
- U.S. NATIONAL ARCHIVES • ROBINS AIR FORCE BASE
- INTERNATIONAL MONETARY FUND • NELLIS AIR FORCE BASE • TRENT UNIVERSITY
- GRAND RIVER HOSPITAL • JAMES PATON MEMORIAL HOSPITAL • NEW HIGHLAND VIEW REGIONAL HOSPITAL
- SOUTH SHORE REGIONAL HOSPITAL • ALAMANCE REGIONAL MEDICAL CENTER
- BOSTON SCIENTIFIC • SHERATON CASINO • SIOUXLAND CANCER CENTER
- HALIFAX DEVELOPMENT CENTER • FERMILAB FEYNMAN COMPUTING CENTER
- CORRECTIONAL FORENSIC CENTER • NEW YORK DAILY NEWS
- CONNECTICUT POST NEWS • ACADIA UNIVERSITY
- DALHOUSIE UNIVERSITY • GRAND VALLEY STATE UNIVERSITY
- BROOKFIELD ZOO • INCHON AIRPORT, KOREA • XWAVE OFFICE TOWER

The Ultimate Humidification Solution

TYPICAL MEE FOG HVAC INSTALLATION



Spray Distance:

Air velocity and spray distance establish residence time for the fog droplets. With a greater residence time, more fog will evaporate. The ratio of evaporated fog to drain water establishes the evaporative efficiency of the system.

Controlling Fog System Output:

Fog output can be controlled either by staging the fog nozzles (with solenoid valves) or by means of a variable speed pump. Varying the speed of the pump varies the pressure and flow at the nozzles. Staging of the fog nozzles is the least expensive method and usually gives adequate control in commercial buildings. Industrial applications with little or no return air often require variable speed control.

Supply Water:

Proper treatment of the supply water is a critical aspect of fog system design. Otherwise when waters with high levels of dissolved minerals are used for fog humidification, the water evaporates but the minerals remain in the air as dust particles. This mineral dust eventually settles and can create a housekeeping problem in indoor spaces. To help keep spaces clean, Mee's water treatment experts will help you determine the best and most cost-effective treatment method for your particular application.

INNOVATIVE FOG SOLUTIONS ARE GUARANTEED WITH MEE INDUSTRIES

Many modern manufacturing processes benefit from proper humidification. Humidification can often significantly increase both production speed and product quality. Processes that require strict humidity control include textiles, woodworking, printing, electronic and microchip fabrication, and many processes that include gluing, bonding, and coating operations. Static electricity problems are also eliminated in a properly humidified plant environment.

Modern Indoor Air Quality standards often make it necessary to introduce more air into industrial plants. If the outdoor air is very cold or very dry the result can be a dramatic decrease in the indoor relative humidity. Often indoor relative humidity problems crop up when older machines are replaced with faster, higher energy machines. The extra heat added can drive down plant humidity levels.

Many industrial plants can be humidified by installing the fog nozzles directly over the manufacturing floor. This is often the optimum configuration in plants that have excessive internal heat loads because it is sometimes not possible to reach the desired humidity level by humidifying duct air.



Plant humidification with a Mee Fog system.

**Some Mee Fog Users
1000's of Installations**

PRINTING

- AMERICAN GREETINGS • STANDARD REGISTER
- QUAD GRAPHICS • PBM GRAPHICS
- REYNOLDS & REYNOLDS • R.R. DONNELLY
- INDIANAPOLIS STAR PRESS • ANN ARBOR NEWS
- AKRON BEACON JOURNAL
- REGAL GRAPHICS • CLARK AMERICAN
- PRECISION LITHO • MUSKEGON CHRONICLE
- SPARTAN GRAPHICS • STOLZE PRINTING
- ADPRO LITHO • RAPID REPRO PRINT
- HEWITT ASSOCIATES

WOODWORKING

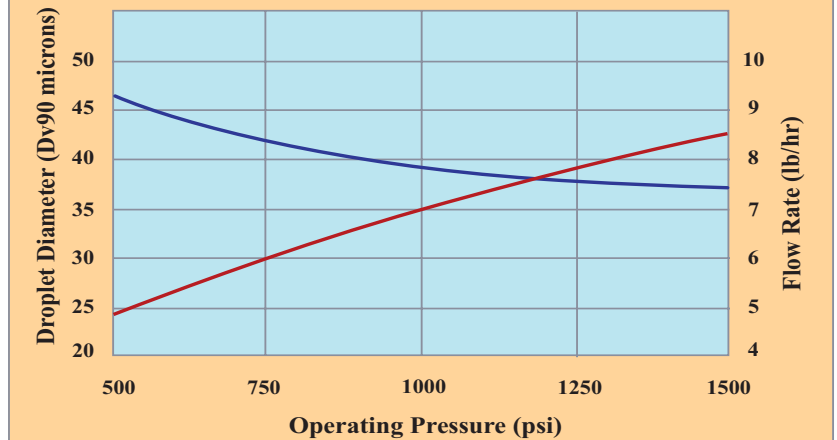
- LAZY-BOY • PENNSYLVANIA HOUSE
- KINCAID FURNITURE • HAMMERY FURNITURE
- HOOKER FURNITURE • STEELCASE FURNITURE
- BROYHILL FURNITURE • TRIANGLE PACIFIC
- GEORGIA PACIFIC • FENDER MUSICAL INSTRUMENTS
- OMEGA CABINETS • SHAFER COMMERCIAL SEATING
- MASTER BRAND CABINETS/D'ECOR
- O'HARE SHUTTERS • APPALACHIAN WOOD
- MASTERCRAFT INDUSTRIES

TEXTILES

- PROCTOR & GAMBLE • W.L. GORE
- PARKDALE MILLS • WRANGLER
- WEST POINT STEVENS • PHARR YARNS
- SYNTHETIC INDUSTRIES • MILLIKEN & COMPANY
- ADVANCED GLASS FIBER
- LIBERTY FABRICS • R.L. STOWE
- SHUFORD MILLS • PGI NONWOVENS • MOHAWK INDUSTRIES
- BBA NONWOVENS • SPRINGS INDUSTRIES
- QUAKER FABRICS • BEIERSDORF JOBST • RENFRO HOSIERY



Swirl-jet Nozzle (SJ-7)



Swirl-jet nozzles are suitable for industrial plant humidification and outdoor cooling applications. They have a built-in anti-drip valve, removable filter, and are available in three sizes in both brass and stainless steel. They can be used at pressures up to 1500 psi.

Understanding Fog Droplet Size: Water atomizing nozzles produce a wide range of droplet sizes and there are many statistical methods used to characterize the size of droplets found in the spray. The above chart gives the Dv90 diameter. Ninety percent of the volume flow of water from the nozzles is in droplets that are equal to or smaller than the Dv90 number. The results shown are based on laser particle analysis performed in still air, three inches from the nozzle orifice.

High-pressure Pump Units:

Mee Fog systems use only the highest quality, ceramic plunger pump units. Pumps have either stainless steel or bronze heads and are designed to operate at 1000 psi to 3000 psi. All Mee Fog pump units are operated at low speeds (usually below 700 rpm) to avoid excessive noise and vibration and to ensure low maintenance and long life.



Each Mee Fog system undergoes rigorous quality control checks and is fully tested prior to shipment.



Proven Mee Fog system pumps are conservatively designed to operate below 70% of rated output which translates into high field reliability and service life.

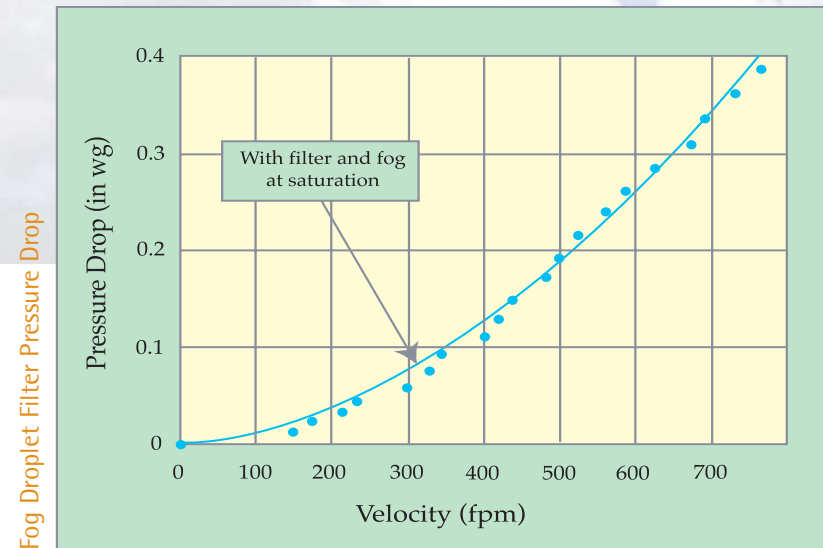


Fog Nozzle Manifolds:

Mee Fog nozzle manifolds are constructed of 316L stainless steel tube with the nozzles evenly spaced in the fog plenum. The open network of tubes results in a negligible pressure drop. Stainless steel nozzles with replaceable filters offer easy maintenance and dependable service for many years to come.

Fog Droplet Filters

Droplet filters remove un-evaporated fog droplets from the air stream. The collected water is drained away. It is generally not considered beneficial to reuse the drain water but with proper treatment it can be done. Droplet filters are cleaned on a continual basis by the collected fog water. Filters are constructed of special polymers and include built-in biocide agents, and have a Class I fire rating. Fog droplet filters can be used with air velocities up to 750 feet per minute.



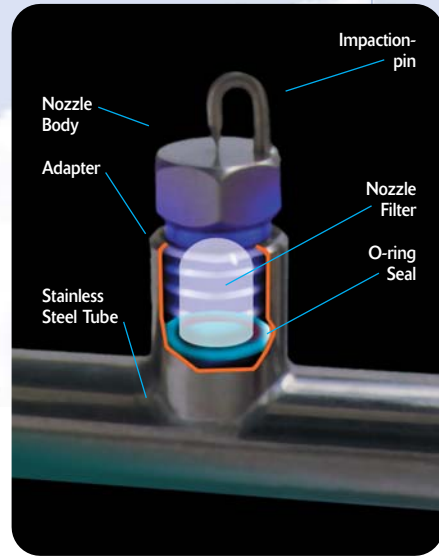
Fog Droplet Filter Pressure Drop



Fog droplet filters are supplied in stainless steel frames and are made to fit each individual application.

Technologically Robust Mee Fog Nozzles

IMPACTION-PIN NOZZLE



Impaction-pin nozzles are the highest quality fog nozzles available on the market today. The nozzles are manufactured in the Mee factory to our exacting quality specification. Each fog nozzle is individually tested and adjusted before shipment. Mee Industries Inc. is an ISO 9001 certified company.

SPECIFICATIONS

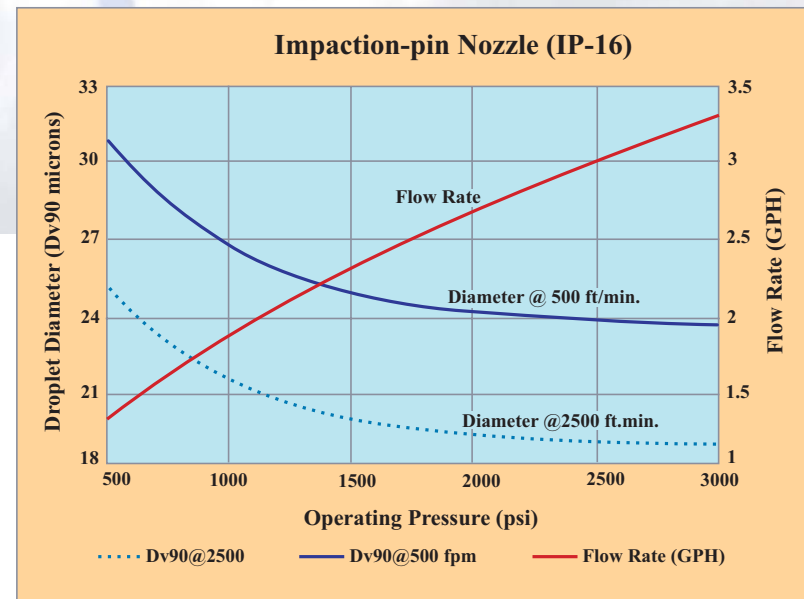
Body: 316 L stainless steel, 1/8" NPT thread, flat base for o-ring seal. Includes hole for optional tie-wire.

Orifice: Low frictional losses, 0.006-inch (150 micron) diameter.

Impact-pin: Micro-machined, 0.01-inch (250 micron) diameter tip, TIG welded.

Tube Adapter: 316 L stainless steel or nickel plated brass, 1/8" NPT thread, o-ring seal for easy removal.

Tube: 316L stainless steel, meets ASTM A269 and ANSI B31.1.



Impaction-pin nozzles are ideal for in-duct humidification.

Understanding Fog Droplet Size: Water atomizing nozzles produce a wide range of droplet sizes and there are many statistical methods used to characterize the size of droplets produced. The above chart gives the Dv90 diameter. Ninety percent of the volume flow of water from the nozzles is in droplets that are equal to or smaller than the Dv90 number. The results shown are based on laser particle analysis performed three inches from the nozzle orifice at two different airflow velocities. Droplet size decreases as air velocity is increased because the higher velocity separates droplets of different sizes into different flow paths, which results in fewer droplet collisions and less agglomeration.

Ultra-fine fog droplets represent a huge evaporative surface area. They evaporate quickly and raise the humidity of the surrounding air. This, together with the fact that the evaporation process is adiabatic (occurring at constant enthalpy), means that the total energy of the air has not been increased, and therefore condensation in the downstream ductwork and the IAQ problems that result from condensation are virtually eliminated.

CHOOSE THE ONE THAT HAS IT ALL

Evaporative Cooling:
Factories and mills
Food processing
Gas turbine inlet air cooling
Industrial plant cooling
Zoos and botanical gardens

Water Atomization:
Architectural fountains
Dust and odor control
Landscape enhancement
Particle scrubbers
Theatrical effects
Waste water evaporation

Humidification:

Botanical gardens and atria
Computer clean rooms
Food processing
Hospitals and laboratories
Leather processing plants
Lumber drying and storage
Office buildings and hotels
Painting and coating
Printing and paper factories
Textile and furniture mills



RESEARCH & DEVELOPMENT

Mee Industries is committed to an extensive research & development program designed to continuously optimize and enhance its Mee Fog systems. The 3,000 sq. ft. research facility is equipped with a fully instrumented, variable-air-velocity duct section and state-of-the-art laser particle measuring instruments.



Mee Industries provides complete analysis of water and designs a treatment system to fit a wide variety of fog applications.



Mee Fog nozzle droplet sizing with laser particle analyzer instrument.

Wind tunnel used to study droplet kinetics and thermodynamics. Research & development facilities such as these set Mee Industries apart from the competition.